

REMARKS

Claims 36, 41, 58, 62, and 69 have been amended; claim 59 has been cancelled; and claims 75 and 76 have been newly added. Claims 36-58 and 60-76 are now pending in the application. Applicants respectfully request reexamination and reconsideration of the application as amended.

Initially, it should be noted that, other than specifying that the substrate is flexible and pressure activated, the amendments to claim 36 were not made for patentability reasons but to clarify and even broaden the scope of the claims. The amendments to the dependent claims were not made for patentability reasons.

As another initial matter, Applicants note that an Information Disclosure Statement listing 54 references was mailed on January 8, 2002 and received by the PTO on January 28, 2002. The form 1449 (four pages) was not, however, returned with the most recent Office Action. Applicants ask the Examiner to initial the form 1449 and return the initialed form 1449 with the next Office Action.

Claims 36-74 have been rejected in view of one or more references, US Patent No. 5,791,914 to Loranger et al. ("Loranger") being the principal reference. Applicants respectfully traverse this rejection.

Independent claim 36 now includes a "flexible substrate" that is pressure activated to create electrical connections from terminals on the flexible substrate through the elongate resilient contact elements of the interposer to terminals on a semiconductor device. Neither Loranger nor any of the other references of record teach or suggest a pressure activated, flexible substrate. Therefore, independent claim 36 and its dependent claims (claims 37-57 and new claim 75) patentably distinguish over Loranger and the other references of record.

Independent claim 58 now describes a test system for testing a semiconductor wafer comprising a plurality of unsingulated dice. Loranger, on the other hand, teaches nothing more than a simple socket in which a singulated, packaged integrated circuit is secured. Nothing in Loranger teaches a system for testing unsingulated semiconductor dice, nor does Loranger provide any motivation or teaching that would lead one of ordinary skill to modify Loranger to test semiconductor wafers comprising a plurality of unsingulated dice in wafer form. Indeed, a modification would require such a radical and thorough change as to completely alter the character and structure of Loranger. Therefore, independent claim 58 and its dependent claims

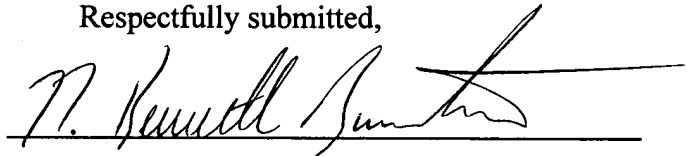
(claims 60-74 and new claim 76) patentably distinguish over Loranger and the other references of record.

In view of the foregoing, Applicants respectfully submit that the instant application is in condition for allowance. Reconsideration of the application is respectfully requested, and early allowance of the claims is solicited. If the Examiner believes that a discussion with Applicants' attorney would be helpful, the Examiner is invited to telephone the undersigned at (925) 456-3915.

Although Applicants believe that all required extensions of time and fees have been requested and provided for, Applicants petition the Director for any extension of time deemed necessary for acceptance of this paper, and Applicants authorize the Director to charge any fee (including the fee for any necessary extension of time) deemed necessary for acceptance of this paper to Deposit Account No. 50-0285 (order no. P70-US).

Respectfully submitted,

Date: September 26, 2002

A handwritten signature in dark ink, appearing to read "N. Kenneth Burraston", is written over a horizontal line.

N. Kenneth Burraston
Registration No. 39,923

FormFactor, Inc.
Legal Department
2140 Research Dr.
Livermore, CA 94550
925-456-7355
925-294-8147 Fax

VERSION WITH MARKINGS TO SHOW CHANGES

Claims 36, 41, 58, 62, and 69 have been amended as follows:

36. (Amended) A test apparatus for testing a semiconductor device, said test apparatus comprising:

 a flexible contactor comprising first and second opposing surfaces and a first plurality of terminals disposed on said first surface;

 an interposer comprising:

 a substrate,

 a first plurality of elongate, resilient contact elements [disposed on] extending from a first side of said substrate, ones of said first plurality of contact elements [being in contact with] corresponding to ones of said first plurality of terminals, and

 a second plurality of elongate, resilient contact elements [disposed on] extending from a second side of said substrate, ones of said first plurality of contact elements being electrically connected to ones of said second plurality of contact elements; and

 a base for supporting said semiconductor device[, said base configured to move said semiconductor device such that ones of a second plurality of terminals on said semiconductor device contact ones of said second plurality of contact elements],

wherein upon application of a pressure differential between said first and second surfaces of said flexible substrate, said flexible substrate flexes, creating electrical connections between ones of said first plurality of terminals on said contactor and ones of a second plurality of terminals on said semiconductor device through ones of said first plurality and second plurality of contact elements.

41. (Amended) The test apparatus of claim [36] 75, wherein said first plurality of contact elements are disposed on said first side of said substrate at a first pitch, and said second plurality of contact elements are disposed on said second side of said substrate at a second pitch different than said first pitch.

58. (Amended) A[n] test apparatus for testing a semiconductor [device] wafer comprising a plurality of unsingulated dice, said test apparatus comprising:

a contactor comprising a first plurality of terminals;

an interposer comprising:

a substrate,

a first plurality of elongate, resilient contact elements [disposed on] extending from a first side of said substrate, ones of said first plurality of contact elements corresponding to ones of said first plurality of terminals, and

a second plurality of elongate, resilient contact elements [disposed on] extending from a second side of said substrate, ones of said first plurality of contact elements being electrically connected to ones of said second plurality of contact elements;

[a support, said interposer moveably disposed in said support, said interposer moveable between a first position in which said first plurality of contact elements do not contact said first plurality of terminals and a second position in which ones of said first plurality of contact elements contact ones of said first plurality of terminals;] and

a base for supporting said semiconductor [device] wafer, said base configured to move said semiconductor [device] such that ones of a second plurality of terminals on said unsingulated dice of said semiconductor [device contact] wafer are pressed against ones of said second plurality of contact elements [and further move said semiconductor device such that said interposer moves from said first position to said second position] forming electrical connections between ones of said second plurality of terminals of said unsingulated dice and ones of first plurality of terminals on said contactor through ones of said first plurality and second plurality of contact elements.

62. (Amended) The test apparatus of claim [58] 76, wherein said first plurality of contact elements are disposed on said first side of said substrate at a first pitch, and said second plurality of contact elements are disposed on said second side of said substrate at a second pitch different than said first pitch.

69. (Amended) The test apparatus of claim 58, wherein said first plurality of contact elements [are resilient and] are compressed while said [interposer is in said second position] ones of said second plurality of terminals on said unsingulated dice of said semiconductor wafer are pressed against said ones of said second plurality of contact elements.